

FUEL CELLS HAVING SILICON SUBSTRATES
AND/OR SOL-GEL DERIVED SUPPORT STRUCTURES

ABSTRACT OF THE DISCLOSURE

Fuels cells, electrode assemblies, and electrodes that comprise silicon and/or sol-gel derived support structures, as well as to methods relating thereto, are disclosed herein. In one embodiment, the invention is directed to an electrode assembly adapted for use with a fuel cell comprises: an anode derived from a first planar silicon substrate; an electrolyte; a cathode derived from a second planar silicon substrate; wherein the anode and the cathode are parallel to each other and separated by an interstitial region comprising the electrolyte. In another embodiment, the invention is directed to electrode adapted for use with a fuel cell, wherein the electrode comprises a silicon substrate that functions as a current conductor, wherein the silicon substrate has a plurality of pores that define pore surfaces, wherein at least a portion of the pore surfaces have a catalyst thereon, wherein the catalyst is derived from one or more metallic precursors chemisorbed onto at least the pore surfaces.